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CONTRIBUTIONS TOWARD A KNOWLEDGE OF THE
INSECT FAUNA OF LOWER CALIFORNIA

No. 10

COLEOPTERA: SCARABAEIDAE

BY

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THE PRESENT report is concerned primarily with the insect materials collected by A. E. Michelbacher and E. S. Ross in their expedition of 1938, and a few additional records collected by Ross and G. E. Bohart in 1941. I have also included all additional records or references at present known to me.

Large series were obtained of several species previously known in collections by but very few individuals; in the case of such species as *Phyllophaga* (*Listrochelus*) *densicollis* (LeConte) and *P. (L.) carminator* (Horn), these collections have allowed a proper understanding of the species limits, whereas formerly for a time they were thought to be the opposite sexes of one and the same species. In the interesting genus *Acoma* and the well-known *Serica* a number of new species were taken, and in all probability the number of new forms is by no means yet exhausted.

I am much indebted to individuals for various forms of assistance in preparing the present report, among them especially Dr. R. C. Miller, Dr. E. C. Van Dyke, and Dr. E. S. Ross of the California Academy of Sciences, as well as Dr. Mont A. Cazier of the American Museum of Natural History. All types of new species are in the California Academy of Sciences, and the references to the Saylor Collection herein made are somewhat antedated, because since writing the body of this paper I have presented the extensive Saylor Collection of scarabs to the California Academy of Sciences.

(1) **Chaunocolus cornutus** Saylor

Chaunocolus cornutus SAYLOR, 1937, Bull. So. Calif. Acad. Sci., 36:35, fig. 3; SAYLOR 1939, Proc. Ent. Soc. Wash., 41:54.

This small (4.7 mm. long), strongly shining, rufocastaneous species is known only by the type and one other specimen. The thorax has two high, oblique tumosities each side of the middle, and the surface between is deeply concave. The claws are long, with a minute tooth at center. Propygidium and fifth sternite not connate but separated as in *Oncerus*, with the last spiracle very minute and apparently below the suture. Head with a stout horn at center base of the front.

Type locality: La Paz, Lower California.

Recorded distribution: "Lower California," one specimen.

Only this single species is known of the monotypic genus *Chaunocolus* Saylor, and further study of adequate series will most probably necessitate changing its position among the melolonthine tribes.

(2) **Nefoncerus convergens** (Horn)

Oncerus convergens HORN, 1894, Proc. Calif. Acad. Sci., (2) IV:394.

Nefoncerus convergens, SAYLOR, 1938, Proc. Ent. Soc. Wash., 40:102, fig. 2 (a-e).

I have seen only 7 specimens of this rather rare and localized species. The genus is characterized by having the front claws of the male dissimilar to each other and also to the hind and middle claws of the females, with the middle claws with a large basal dilation and thus appearing tridentate; abdominal sutures strong, the segments entirely free; hind spurs inserted definitely *before* the apex and on the outer, upper margin; clypeus strongly convergent apically. *Nefoncerus* Saylor is readily separable from *Oncerus* Horn, its nearest relative (known only from California), by the latter possessing similar front claws in the male and having the hind spurs inserted *at* the apex of the tibia. Full details concerning *Nefoncerus* and *Oncerus*, with drawings of all the anatomical parts, and erecting the subfamily Oncerinae for the two genera, are given in the above cited paper by Saylor.

Type locality: Calmalli Mines and San José del Cabo.

The specimens I have studied have all been from San José del Cabo. Judging from other habits of the group, the adults should be found frequenting flowers of such families as the Compositae.

(3) **Chnaunanthus discolor** Burmeister

Chnaunanthus discolor BURMEISTER, 1844, Handb. d. Entom., 4:32; BATES, 1887, Biol. Cent.-Amer., Col., II, 2:130; DALLA TORRE, 1912, Coleop. Cat., 45:7; SAYLOR, 1937 Jour. Wash. Acad. Sci. 27(12):535, f. 3.

The species varies considerably in color, the elytra ranging from entirely testaceous, through testaceous with black cloudings on the disc, to almost entirely piceocastaneous; the thorax may be piceorufous, rufous with testaceous markings on the lateral margins, or (rarely) be almost entirely testaceous.

Type locality: San José del Cabo.

Recorded distribution: Mexico.

Apparently the species is fairly well distributed in certain parts of Lower California, and the adults are said to frequent the flowers of Compositae, and are taken in the early spring.

Chnaunanthus Burmeister and the European *Chasmatopterus* Latreille form the subfamily Chasmatopterinae. This group is thoroughly revised and reviewed in the paper cited above by Saylor in 1937.

(4) ***Podolasia varicolor*** Saylor, new species

Male: Shining, pilose above. Color of head, thorax, elytral apices, and legs piceous (color variations are mentioned later herein); the elytra and tarsi rufotestaceous. Clypeus flat at base, deeply concave and very strongly reflexed apically, the apex broadly rounded, the angles narrowly rounded and the sides subparallel; basal $\frac{2}{3}$ of disc coarsely and contiguously punctate, and coarsely rugose, with short, erect hair, the apical $\frac{1}{3}$ smooth and but little punctate. *Head* with a very strong transverse carina behind the carinate clypeal base, the remainder of front and vertex polished and hardly punctate except somewhat so laterally. Antenna 9-segmented, the club small and ovate and the last segment of the club deeply and obviously concave on its outer surface. *Thorax* with the base completely margined, the sides rounded and ciliate; hind angles very broadly rounded and not obvious; front angles obtuse, discal surface just posterior to apical margin transversely, narrowly impressed; disc highly polished, with a few sparse and very irregularly placed punctures near middisc, these somewhat closer at front angles and sides, but nowhere dense; the disc with a few long erect hairs near sides, otherwise glabrous. Scutellum small, usually impunctate. Elytral striae lacking, the sutural striae ill-defined and narrow; disc coarsely, sparsely and somewhat regularly punctate, with sparse, short, suberect hairs. Pygidium small, polished, strongly triangularly-shaped, with extremely fine punctures and very dense, very long, erect hairs. *Abdomen* polished, sutures fine but obvious, surface very finely and sparsely punctate, with long, erect hairs. *Legs* strongly fossorial, the hind femora massive and over $\frac{3}{5}$ as broad as long. Hind tibia triangularly-shaped, strongly narrowed apically, with a very strong, complete, oblique carina in apical $\frac{2}{5}$. Hind tarsi about one and one-half times longer than hind tibia, the first tarsal segment much longer than the second. Hind spurs broad, well developed. Claws long, graceful, simple. Front tibia very strongly bidentate, the teeth strongly acute and well developed. *Wings* also well developed. Underside quite pilose. *Genitalia* symmetrical, the apex of each lateral lobe in enface view strongly thickened and triangular.

Female: Differs from male only in the abdomen being somewhat more robust, the sutures much less obvious, and the disc less punctate. Length 4–7 mm. Width 1.8–3 mm.

Holotype, male (C.A.S. No. 5377) is from "15 miles W. of La Paz, VII-5 to VII-21, 1938, collected by Michelbacher and Ross," collected at light. The female *allotype* if from "Venancio, VII-17, 1938, collected by Michelbacher and Ross." A female paratype, in the collection of Mr. Mark Robinson of Philadelphia, who kindly loaned the specimen for study, is from "Marguerita Island, L. Calif." Of the remaining 91 paratypes, most are from the same localities as the types, with the additional locality of "45 mi. N. of San Ignacio, VII-27-38, Michelbacher and Ross, at light."

Although I had at first decided to designate only the small series from La Paz as types, owing to the great amount of variation in individual size and coloration, I have decided that it is reasonably safe to designate all as types. The comparison of the 90-odd examples of this species from four scattered localities in Lower California forces me to the conclusion that this is an extremely plastic species, especially as to color and size. When the large, distinctly bicolored examples from La Paz are placed alongside the small unicolorous testaceous specimens from Venancio which are scarcely half their size, they appear quite different; all types of intermediates occur, however. Specimens from Venancio vary from unicolorous testaceous or castaneous to distinctly bicolored as in the La Paz examples, and the size varies accordingly. All 10 specimens from San Ignacio are exactly similar (rufotestaceous or rufopiceous head and thorax, and testaceous elytra), while the small La Paz series is also quite similar in color (black, with testaceous elytra, the latter with sides and apices usually black) but vary greatly in size. The specimen from Marguerita Island is almost similar to the La Paz examples, but the elytra are entirely testaceous. The male genitalia and wing characters from specimens from the various localities do not appear to differ. The most variable characters are the size, color, rugosity of inner part of hind tibia, and puncturation of the hind femora and the thoracic disc.

The only other described species of the genus *Podolasia* Harold, is *ferruginea* LeConte, known from Texas, and the two species may be separated by the characters given in the key below.

Key to the Species of *Podolasia*

- Hind tibia with a nearly or quite complete transverse, semioblique carina at apical third; clypeus with a group of dense, semirugose punctures in basal area; front immediately behind the clypeal carina strongly separated from the remainder of the front by a strong carina; color variable, at times unicolorous testaceous but usually somewhat bicolored. Lower California.....*varicolor* Saylor
- Hind tibia with a short, strongly oblique carina running from a third to nearly a half the distance across the tibia, but no more; clypeus more or less regularly though sparsely punctate over the entire surface, without a densely punctate spot at base; front behind the carina of the clypeal suture flattened but not at all carinate; color always pale testaceous. Texas, U.S.A.*ferruginea* LeConte

The mouthparts and connate abdominal segments of this genus appear to place it in the subfamily Chasmatopterinae; however, the general habitus and

the remaining morphological features are radically different and prevent its inclusion in this subfamily, and proper phylogenetic placement of the genus will have to await further study.

(5) ***Acoma robusta*** Van Dyke

Plate 13, fig. 1.

Acoma robusta VAN DYKE, 1928, Pan-Pac. Ent., IV:159; SAYLOR, 1937, Bull. S. Calif. Acad. Sci., 36:37.

Male: Color always piceo castaneous, strongly polished above, usually with long, moderately dense, yellowish-white dorsal hairs. Size variable. Head with clypeus fairly long, semiovate in outline, the margins very strongly reflexed, the apex subtruncate or faintly emarginate; disc densely punctate. Front finely cribrate; vertex smooth and impunctate. Antenna 9-segmented (Fig. 1a, Plate 13); club 5-segmented, the first segment of club (fifth of antenna) only $\frac{3}{4}$ as long as the remainder. Thorax convex, all margins densely ciliate; disc with an impunctate narrow central line, the remainder finely to coarsely punctured; front angles acute and produced; thorax sides subparallel in basal half, the hind angles narrowly rounded, sides convergent apically in apical half; base strongly and completely margined. Elytra with rows of punctate striae, with scattered hairs. Pygidium convex, strongly punctured, with dense very long hairs. Length 7–10 mm. Width 2.8–4.8 mm.

Type locality: La Paz, in June; Triunfo, in July.

New records: 7 males, collected by Michelbacher and Ross at "15 miles W. of La Paz" July 5, and at Santiago on July 8.

This is the largest species known of the genus, and can be confused only with the following new species, which possesses only 4 segments in the male antennal club.

The females of this genus are apparently not known, as all examples and records are males; in all probability the female antenna will prove to be quite different from the male's, judging from other related genera.

(6) ***Acoma cazieri*** Saylor, new species

Plate 14, fig. 4.

Male. Large, robust. Color dark piceocastaneous, surface shining above. *Antenna* with 4 segments in the club, the 4 segments of approximately the same length. *Head* with front very coarsely cribrate. Otherwise, apparently similar in all respects to *A. robusta*. Length 10–11 mm. Width 4.5–5 mm.

Holotype, male (C.A.S. No. 5688) is from 15 mi. N. of El Refugio, collected by Michelbacher and Ross on July 4, 1938. Two male paratypes, collected by the same men at San Domingo on July 19.

This species is named after my good friend Dr. Mont Cazier, Curator of Insects at the American Museum of Natural History, who did some of the preliminary work on separating the specimens and turned them over to me to complete.

(7) **Acoma dilemma** Saylor, new species

Plate 13, fig. 2.

Male: Small, color rufocastaneous to castaneopiceous, shining above. Clypeus short, small and evenly rounded. *Head* with front and clypeal base finely but very densely granulate. *Antenna* with club $3\frac{1}{2}$ segmented, that is the first segment of club (or 6th segment of antenna) about $\frac{2}{5}$ as long as the remaining three club segments. Elytral hairs quite long and moderately thick. Otherwise, all characters apparently similar to *A. robusta*. Length 5.5–7 mm. Width 2.5–3 mm.

Holotype, male (C.A.S. No. 5689) and paratype male are both from **15 mi. N. of El Refugio**, collected by Michelbacher and Ross on July 4, 1938.

(8) **Acoma sexfoliata** Saylor, new species

Plate 13, fig. 6.

Male: Color rufobrunneous, shining above. *Head* with front very coarsely cribrate, and the clypeus with a bidentate apex, the two blunt but acute teeth separated by a narrow emargination, and the lateral margin of clypeus strongly reflexed and strongly convergent apically, clypeus not very concave. *Thorax* much more transverse than in *robusta*, and the punctures very coarse and rather dense, much smoother basally; sides of thorax slightly convergent in basal half and strongly convergent in apical half; front angles blunt and obtuse. Elytral hair short. *Antenna* with third segment very long (Fig. 6a, Pl. 13) and the long club 6-segmented. Otherwise similar to *robusta* in most essential characters. Length 5.5–6.5 mm. Width 2.5–2.8 mm.

Holotype, male (C.A.S. No. 5690) and 3 paratype males from **7 mi. S. of El Marmol**, collected by Michelbacher and Ross on June 18, 1938. An additional male paratype was taken at El Marmol on September 24, 1941, by Messrs. Ross and Bohart.

This species is the most distinct in the genus, and the six-segmented antennal club, dentate clypeus and thoracic shape will readily place it.

(9) **Acoma rossi** Saylor, new species

Plate 13, fig. 5.

Male: Castaneous to castaneopiceous, shining above. *Head* with front very coarsely cribrate. Clypeus deeply concave, sides very convergent anteriorly, apex truncate and slightly to moderately emarginate, thus clypeus appears to have 2 obtuse teeth or in some specimens is definitely bidentate. *Antenna* with 5-segmented club, the 3d antennal segment as long as 2d, the 4th long and nearly three times longer than the 2d (Fig. 5a, Pl. 13). *Thorax* as in *sexfoliata*. Otherwise, essential characters as in *robusta*. Length 4.5–7 mm. Width 2–3 mm.

Holotype, male (C.A.S. No. 5691) is from **15 miles north of Punta Prieta**, collected by Michelbacher and Ross on July 29. Two male paratypes, same

data as type. Fifteen additional male paratypes are from 10 mi. S. of Punta Prieta, collected by the above men on June 21.

This species is closest to *sexfoliata* Saylor in most characters, but the antennal club is 5- and not 6-segmented, and the clypeus is a little different in shape and the front is much more coarsely crenate.

(10) ***Acoma confusa*** Van Dyke

Plate 13, fig. 3.

Acoma confusa VAN DYKE, 1928, Pan-Pacif. Ent., 4:160.

Type locality: Coronodos Island, Gulf of California, May; Loreto, Lower California, May.

New records: Series of males taken by Michelbacher and Ross in 7 different localities as indicated: Mesquital on July 28, 15 mi. N. of San Ignacio on June 24, and July 26, 25 miles S. of Santa Rosalia on July 25, Venancio on July 17, 15 mi. W. of La Paz on July 5, and Santiago on July 8.

The examination of 37 specimens taken in 7 localities, the extremes of which are separated by approximately 500 miles, represents some very interesting results. A small red specimen from the southern Santiago when compared to a large and darker example from the northern Mesquital appears quite different, and both also differ in the following respects (characters which usually are specific in other related genera): shape and proportion of thorax; shape and proportion and sculpturing of clypeus; and length of the antennal club.

Thus in what I believe to be one species the length varies (even the same locality) from 3.5 to 10 mm.; the clypeus may be as long as width through base, to one-half longer than width, with the sides rounded and greatly reflexed to strongly acuminate apically, with the apex evenly rounded to narrowly subtruncate to emarginate; clypeal puncturation may be sparse to dense and the base may be transversely tumid (all Mesquital examples) or not at all so, also the front and clypeal base juncture varies from finely and evenly tuberculate to very coarsely cribrate; front thoracic angles vary from bluntly obtuse, to rectangular, to acute and strongly produced; the basal half of the thorax may have evenly rounded sides which are slightly acuminate basally, varying to the sides subparallel, and in some examples the center margin of the basal half of thorax is slightly sinuate; antennal club is longer in northern areas and becomes progressively smaller in specimens as one goes south. Thus it is readily seen that usually reliable characters of specific import do not hold in this species if my interpretations are correct.

A. confusa possesses a three-segmented antennal club in the male sex, and in this regard, it resembles *brunnea* Casey and *arizonica* Brown from our southern United States borders, but differs especially in the coarse, not cribrate puncturation of front, in the acute rather than blunt thoracic angles, in the darker color, slightly longer antennal club, and longer elytral hair.

(11) *Dichelonyx picea* Horn

Dichelonyx picea HORN, 1894, Proc. Calif. Acad. Sci., (2), 4:396; FALL, 1901, Trans. Amer. Ent. Soc., p. 289; SAYLOR, 1945, Bull. Brook. Ent. Soc., 40:154. (Revision of genus).

This uncommon species, of which I have seen the Horn types and about two dozen additional examples, is the only species of the genus which is most commonly vittate on the elytra, and also is the only one with 8-segmented antennae.

Type locality: "San José del Cabo and El Chinche, 2000 ft," types in the California Academy of Sciences.

New records: Miraflores, VII-2, collected by Slevin; three records by Ross and Bohart, namely Todos Santos, X-18-41, Arroyo Seco, X-1-41, and Las Animas, Sierra Laguna, X-12-41; and the remaining two records collected by Michelbacher and Ross, namely Triunfo, VII-13-38, and 5 mi. W. of San Bartolo, VII-13-38.

(12) *Dichelonyx pusilla* LeConte

Dichelonyx pusilla LECONTE, 1856, Jour. Acad. Sci. Philadilphia, p. 282; HORN, 1894, Proc. Calif. Acad. Sci., (2), 4:335; FALL, 1901, Trans. Amer. Ent. Soc., p. 290; SAYLOR, 1945, Bull. Brook. Ent. Soc., 40:155.

This species is fairly common in California in the general environs of Los Angeles; I have collected it as far north as Santa Barbara, and I do not know that it goes north of that point. The species does not seem to go east of the California borders and is moderately common in northern Lower California. The adults have been recorded as eating roses.

Type locality: "San Diego to Santa Barbara."

Recorded distribution: San Pedro Martin in Lower California, and numerous localities in southern California.

New records: Ensenada, VI-27-35, by Saylor; 17 mi. S. of Ensenada, VII-13-38, collected by Michelbacher and Ross.

The adults of the wholly Nearctic genus *Dichelonyx* Harris are commonly taken on the foliage of coniferous trees, where they are leaf-chafers; some species also feed on plums, snowberries, and other rosaceous plants. The larvae are ground inhabiting, and though several species are known in the larval form (I have collected them feeding on *Artemesia*, *Symphoricarpus*, *Rosa*, and various grass roots), nothing has yet been published on the complete life history. A synoptic revision of the genus by the writer was published in the 1945 paper cited above, and the reader is referred to that publication for a detailed account of the 25 species and 7 subspecies, and a discussion of the extreme color variation found so commonly in this group. The two species inhabiting Lower California may be separated as follows:

Antenna 8-segmented; clypeus smooth, polished, very sparsely punctured, without obvious pile; prothorax without any suggestion of a submedian longitudinal sulcus, and the thoracic color usually brown. L. California only *picea* Horn.

Antenna 9-segmented; clypeus rugose and very densely punctate, with distinct pile; prothorax with a distinct median longitudinal sulcus and the color usually piceous. L. Calif. north to middle California. *pusilla* LeConte

(13) ***Serica rossi*** Saylor, new species

Plate 16, fig. 2.

Male: Surface shining, the elytra faintly pruinose. Color rufotestaceous, the head and thorax more rufous. *Head* with front sparsely and irregularly punctate, the vertex opaque and impunctate. Clypeus with sides straight and with a faint lateral notch just before the angles; apex moderately reflexed and subtruncate, and not emarginate; disc slightly convex, the punctures dense and coarse, the apical fourth nearly smooth and impunctate. *Antenna* 9-segmented, the club slightly longer than the funicle. *Thorax* with ciliate apical and lateral margins, otherwise glabrous; disc moderately densely and regularly punctate, the punctures separated by once or more their diameters. *Scutellum* finely and densely punctate. *Elytra* with very sparse and scattered punctures, and a very few, short, erect hairs; striae wide and quite flat. *Pygidium* pruinose, the punctures very fine and dense, and with short hairs at sides and base, the apical hairs longer. Middle apex of 5th abdominal sternite slightly transversely carinate.

Female: Antennal club shorter than funicle; middle apex of 5th abdominal sternite not carinate, but the apical margin widely arcuate and with a smooth and polished band; pygidium polished, convex, the punctures dense and noticeable, middle disc glabrous. Otherwise as in male. Length 8.5 to 9.5 mm. Width 4.8 to 6.5 mm.

Holotype, male (C.A.S. No. 5372), and *allotype*, female (C.A.S. No. 5373), and 10 paratypes, all from "17 mi. S. of Ensenada, Lower California, VI-14-38, collected at light by Michelbacher and Ross." Three of the paratypes are in the Saylor Collection.

(14) ***Serica michelbacheri*** Saylor, new species

Plate 16, fig. 4.

Male: Body robust. Color rufocastaneous, pruinose, and only faintly shining, with a very few, scattered, erect hairs on the dorsal surface. Clypeus quite long, the sides straight, convergent apically, and without a lateral notch; apex strongly reflexed, and widely and moderately deeply emarginate, the angles narrowly rounded; disc shining and noticeably convex, with fine and dense punctures, the apical fifth very sparsely punctate. Front opaque, the punctures finely, sparsely, and irregularly scattered, the vertex impunctate. *Thorax* with sides entire and ciliate, base not margined, the disc very iridescent and opaque, with the very fine and dense punctures hardly obvious in some lights. *Scutellum* with minute, sparse setigerous punctures. *Elytra* finely and not densely punctured, and like the thorax, the punctures in some lights are not very obvious; discal costae not prominent. *Pygidium*

convex, strongly narrowed apically, the disc polished at base and otherwise pruinose, with very fine and dense punctures, and some lateral and apical erect hairs of moderate length. Length 10 mm. Width 6 mm.

Holotype, male (C.A.S. No. 5374), and two *paratypes*, one probably a female, are from "17 mi. S. of Ensenada, Lower California, VI-14-38, Michelbacher and Ross collectors." One paratype remains in the Saylor Collection; the second is probably a female, but the abdomen is damaged and the genitalia lost. The species is related to *S. mckenziei* Saylor but the male genitalia will readily separate the two.

(15) *Serica ensenada* Saylor, new species

Plate 16, fig. 1.

Male: Color somewhat rufotestaceous, with the elytra faintly shining and the thorax and front tawny colored and very opaque; pilose above. Clypeus moderately long, the sides straight and convergent apically (and without a lateral groove near angles), the apex strongly reflexed and narrowly, somewhat deeply emarginate, the angles narrowly rounded; disc quite noticeably tumid at middle, with a few erect hairs in apical portion, the punctures coarse, nearly contiguous and entirely covering the disc. Vertex very strongly opaque and impunctate; front with few and dense punctures and moderately long, erect yellowish hairs. *Antenna* 9-segmented and unicolorous testaceous; club slightly longer than funicle. Thorax strongly opaque and completely covered with dense, long, erect hairs; sides entire, and ciliate, base not margined; disc with fine, moderately dense punctures. Scutellum with dense fine punctures at sides, somewhat sparser at middle and apically, each puncture with subprocumbent, yellow hairs of moderate length. *Elytra* iridescent, the costae well marked; disc with irregularly placed, mixed punctures of fine and moderate size, the small punctures usually bearing minute hairs and the larger punctures with very long and erect hairs. *Pygidium* pruinose to faintly shining, very finely and densely punctate and with long erect hairs. Length 9 mm. Width 5.3 mm.

Holotype, male (C.A.S. No. 5375), is from "17 mi. S. of Ensenada, Lower California, VI-14-'38, M. and R. coll." A specimen with identical data is at hand and differs from the type mainly in the pygidium being shining and the thoracic hair denser; it is very probably the female of the species, but I leave it without type designation for the present since many species of the genus are very difficult to separate unless series are available. Related to *pilifera* Horn from "Santa Maria" and differs mainly by the more strongly reflexed clypeal apex, the absence of the lateral clypeal notch, much more densely pilose dorsal surface, and more northern range.

(16) *Serica serensia* Saylor, new species

Plate 14, fig. 1.

Male: Robust, pruinose-opaque; coloration castaneo-rufous, the head and thorax a rich velvety brown. *Head* with front very sparsely punctate and faintly shining, the vertex opaque and impunctate. Clypeus shining, very markedly reflexed at apex and sides, being almost bowl-shaped, the sides straight and without a lateral notch, the apex very widely and shallowly emarginate, and the lateral angles narrowly rounded; disc tumid at middle, very densely and coarsely punctured, somewhat less so at sides and near apex, and with a few scattered, erect hairs. *Antenna* castaneous, the club distinctly longer than the funicle. *Thorax* with sides and apical margins ciliate; disc smooth and quite opaque, so that the fine, sparse punctures are only visible with correct lighting. Scutellum punctured as thorax, with a few suberect hairs basally. *Elytra* also punctured, as thorax, the punctures hardly obvious and very few and scattered; striae slightly raised but not prominent, disc with a very few erect hairs. *Pygidium* opaque, very finely and densely punctate, with erect hairs of moderate length. Length 10 mm. Width 5 mm.

Holotype, an unique male (C.A.S. No. 5376), is from "17 mi. S. of Ensenada, Lower California, VI-14-'38, M. and R. collectors." Judging from the fact that this and the preceding three new species, all very distinct, were all collected at the same time and place, and that two of the species are based on unique males, there must certainly be additional new species to be discovered in the area.

(17) *Serica praetermissa* Dawson

Plate 14, fig. 3.

Serica praetermissa DAWSON, 1932, Jour. N. Y. Ent. Soc., 40:536.

The species is chocolate-brown, glabrous above and subshining. The clypeus is feebly tumid at the middle and the margin is strongly reflexed.

Type locality: Paraiso Springs (in central California).

New records: San Martin Islands, V-19-26, Saylor Collection.

Though relatively common in central, coastal California in the regions of Monterey County and south, the species apparently runs into northern Lower California.

(18) *Serica craighead* Saylor

Plate 14, fig. 2.

Serica craighead SAYLOR 1939, Proc. Ent. Soc. Wash., 41:55.

The species is testaceo-castaneous, the head with traces of piceous, and above moderately shining and faintly iridescent. The clypeus is tumid at center, and the lateral margins are not notched. The thorax has a few short erect hairs on each side and the elytra are sparsely clothed with short erect hairs. Length 7.5 mm.

Type locality: Sangre de Cristo, and V. Trinidad, both in Lower California. Known only from the types.

(19) *Serica alternata alternata* LeConte

Plate 14, fig. 4.

Serica alternata LECONTE, 1856, Jour. Acad. Nat. Sci. Philadelphia, 2, 3:276; DAWSON, 1933, Jour. N. Y. Ent. Soc., XLI:435.

The color is dark chestnut, the surface subshining, and the elytra iridescent. The alternate elytral intervals (2, 4, etc.) are slightly wider than the others (1, 3, etc.), hence the name.

Type locality: San Diego, California.

Recorded distribution: Widespread and common in many localities in California, Arizona, Utah, New Mexico, and Colorado.

New records: 12 specimens from "17 mi. S. of Ensenada, Lower California, VI-14-38," and "Hamilton Ranch, Lower California, VIII-2-38," both collected by Michelbacher and Ross.

I have not seen any Lower California representatives of the two common subspecies Dawson described from California (*S. alternata exolita* and *S. a. patruela*), but they may occur, especially near the San Diego border of California. The subspecies are best distinguished through the genitalic characters of the male.

(20) *Serica sculptilis* Dawson

Plate 16, fig. 3.

Serica sculptilis DAWSON, 1922, Jour. N. Y. Ent. Soc., p. 162, f. 19.

Type locality: Camp Baldy, San Bernardino County, California.

Recorded distribution: Mt. Wilson, Claremont, and Ojai Valley, all in southern California.

New records: One male specimen from "17 mi. S. of Ensenada, Lower California, VI-14-38, Michelbacher and Ross collectors."

(21) *Serica pilifera* Horn

Serica pilifera HORN, 1894, Proc. Calif. Acad. Sci., (2), 4:397.

The species is characterized by the pale brown, dull surface, with semierect fulvous hair, the elytral hair being vaguely arranged in rows. Apex of clypeus is moderately reflexed and slightly notched at the sides. Thorax with a few semierect, sparsely placed, brown hairs. Length 8 mm.

Type locality: Santa Maria, in Lower California.

To the best of my knowledge the species is known only from the original types.

(22) *Serica mixta* LeConte

Serica mixta LECONTE, 1856, Jour. Acad. Nat. Sci. Phila., 2, 3:276; DAWSON, 1922, Jour. N. Y. Ent. Soc., 30:166, pl. 22.

Type locality: San Diego, California.

Recorded distribution: The type series of 3 males was described from San Diego and was later described in detail by Dawson, who also figured the geni-

talia. I do not know that the species has actually been found in Lower California; since Horn's record of "San Pedro Martin" was made before the genital characters were used, his identification was very probably based on another species.

(23) **Phyllophaga (Phyllophaga) contaminata** Fall

Phyllophaga contaminata FALL, 1932, Jour. N. Y. Ent. Soc., 40:197.

Phyllophaga extranea FALL, 1932, l. c., p. 198. *New synonymy*.

Both entirely piceous, *contaminata* and testaceous *extranea* were described from single male specimens; the study of 182 additional specimens, with numerous intermediate specimens, indicates that they are extremes of a single highly variable species. One of the more typical color variations is: entire dorsal surface nearly black, except for a narrow to broad lateral testaceous band on the thorax, and the legs are testaceous at base and piceous apically. Another has the head black, the thorax testaceous and a large irregular black spot at the center apex, this spot varying in size from very large, to almost entirely lacking; the elytra are rufocastaneous to nearly piceous. The shape and puncturation of the clypeus and the degree of reflexion of the apical margin vary noticeably between the extremes. The thoracic and elytral puncturation is also variable in many examples. Only 18 specimens in the series are females.

Type locality: "San Bartoleme, Dist. Sur, Lower California" and "San Pedro, Dist. Sur, Lower California."

New records: All collected by Michelbacher and Ross: Triunfo on July 13; 6 mi. N. of Triunfo on July 15; 5 mi. W. San Bartola on July 13; Santiago on July 8; 5 mi. S. of Miraflores on July 8 and 10, and Miraflores on July 8. Also from Agua Caliente, June, and Santa Rosa in August (Saylor Collection).

(24) **Phyllophaga (Phyllophaga) masculicollis** LeConte

Phyllophaga maculicollis LECONTE, 1863, New Spec. Col. I, p. 76; HORN, 1887, Trans. Amer. Ent. Soc., 14:297; HORN, 1894, Proc. Calif. Acad. Sci., (2), 4:336.

Phyllophaga nitidula LECONTE, 1863, l. c., p. 77; HORN, 1887, l. c., p. 192; HORN, 1884, l. c., p. 336. *New synonymy*.

Though not taken by the Michelbacher and Ross expedition, this species has been collected on several occasions. All *maculicollis* I have seen so far are males, and all *nitidula* are females, and there is little doubt that they represent the opposite sexes of one species.

Type locality: Cape San Lucas, Lower California.

Recorded distribution: San José del Cabo, and the type locality.

(25) **Phyllophaga (Phyllophaga) canipolea** Saylor, new species

Male: Elongate, subparallel. Color testaceous, faintly darker posteriorly, shining and glabrous above except for a few short hairs on the front. *Head* with front flat, very coarsely and densely punctate; impunctate along the

bisinate, hardly-impressed clypeal suture; clypeus nearly quadrate, the sides straight, somewhat convergent apically, and slightly reflexed; clypeal apex strongly reflexed, the angles very narrowly rounded, somewhat shallowly but triangularly emarginate between the angles; clypeal disc moderately densely punctate. *Antenna* 9-segmented, testaceous; segments 4 and 5 often faintly dentate within, segments 3-5 of approximate length, 6th shorter, and transverse; club 3-segmented and subequal to length of entire antenna. *Thorax* transverse, all edges heavily margined; sides obtusely angulate slightly before middle, margin entire behind and strongly convergent towards the well-rounded hind angles; front half of sides subcrenate, ciliate, and convergent towards the sharp but barely obtuse front angles; disc irregularly punctate, punctures larger in apical area and near sides, with irregular impunctate areas at center. *Elytra* somewhat coarsely punctate and surface wrinkled, striae other than the narrow sutural striae not obvious. *Pygidium* convex, polished, somewhat coarsely punctate basally, and more finely punctate apically, with minute, hardly obvious hairs, except at sides. *Abdomen* slightly flattened, polished, with moderately dense, rather long hairs on each segment; 5th sternite longer than 4th, and hair a little longer; 6th half the length of 5th. Fore tibia definitely bidentate, the upper tooth very obtuse (i.e., the second tooth). Posterior spurs free, slender; first segment hind legs definitely shorter than the second. All claws similar, and with a very minute tooth just before the small and obtuse basal dilation. Length 11-12 mm. Width 4.6-5 mm.

The male *Holotype* (C.A.S. No. 5692) and 2 male paratypes are from **Canipole**, Lower California, collected by Ross and Bohart on October 2, 1941. One paratype is in the Saylor Collection.

This species is quickly separable from *contaminata* Fall by the unusual shape of the clypeus.

(26) *Phyllophaga (Listrochelus) miraflorea* Saylor

Plate 17, fig. 3; Plate 18, fig. 2.

Phyllophaga (Listrochelus) miraflorea SAYLOR, 1940, Proc. U. S. Nat'l. Mus., No. 3095, p. 72, f. 5 (i-n) and 13 (e-f). (Revision of the subgenus.)

Type locality: Miraflores and 5 mi. S. of Miraflores, collected by Michelbacher and Ross, and in the collections of the California Academy of Sciences. Paratypes from San Bartola, and Triunfo, as well as Miraflores.

Known only from the type series of 30-odd specimens. The male genitalia are asymmetrical.

(27) *Phyllophaga (Listrochelus) densicollis* (LeConte)

Plate 17, fig. 2; Plate 18, fig. 1.

Listrochelus densicollis LECONTE, 1863, Smith. Misc. Coll. No. 167, 6:77; HORN, 1887, Trans. Amer. Ent. Soc., 7:143.

Phyllophaga (Listrochelus) densicollis, SAYLOR, 1940, Proc. U. S. Nat'l. Mus., No. 3095, p. 72, fig. 5 (e, f) and 13 (e, d).

Type locality: Cape San Lucas, in the LeConte collection.

Recorded distribution: Santa Rosa, San Felipe. Michelbacher and Ross obtained a nice series at Santiago on July 8, and at 10 mi. SW. of San Jose Bartola, and San Pedro.

New records: Todos Santos, X-10-41, Ross and Bohart collectors.

The female pygidium varies somewhat in the species, and may be evenly convex, or convex and slightly and longitudinally impressed.

(28) **Phyllophaga (Listrochelus) carminator** (Horn)

Plate 17, fig. 4; Plate 18, fig. 3.

Listrochelus carminator HORN, 1894, Proc. Cal. Acad. Sci., (2), 4:398.

Phyllophaga (Listrochelus) carminator, SAYLOR, 1940, Proc. U. S. Nat'l. Mus., No. 3095, p. 75, f. 5 (a-c), and 13 (g-h).

Type locality: San José del Cabo.

Recorded distribution: Santa Rosa, San Felipe. Michelbacher and Ross obtained a nice series at Santiago on July 8, and at 10 mi. SW. of San José del Cabo on July 9.

The very short upper tooth of the male genitalia is a good distinguishing character. The rugosity of the thorax varies somewhat.

(29) **Phyllophaga (Listrochelus) michelbacheri** Saylor

Plate 17, fig. 1; Plate 18, fig. 4.

Phyllophaga (Listrochelus) michelbacheri SAYLOR, 1940, Proc. U. S. Nat'l. Mus., No. 3095, p. 76, fig. 5 (g, h) and 13 (a, b).

Type locality: 20 mi. N. of Comondu, VII-23, Michelbacher and Ross. Paratypes from same locality, plus La Paz, Vanancio, 15 mi. W. of San Ignacio July 26, San Domingo July 19, 15 mi. N. of El Refugio July 4, 12 mi. S. of Santa Rosalia July 25, and 25 mi. S. of Santa Rosalia July 25; also Palmarita in September.

The female pygidium of this species is very characteristic and will set off this sex immediately from others of the complex. Known only by the type series of some 90-odd specimens, but apparently well dispersed in Lower California, near the Cape Region.

(30) **Phyllophaga (Listrochelus) venodiola** Saylor

Phyllophaga (Listrochelus) venodiola SAYLOR, 1938, Proc. Biol. Soc. Wash., 51:185.

Type locality: Venodio, Sinaloa, Mexico, June, in U. S. N. M.

Additional records: Maria Madre Islands, May 15, in the Saylor Collection and California Academy of Sciences, and Tres Marias Islands, Mexico, Keifer collector, in the California Academy of Sciences.

The species was described from 15 specimens and additional specimens of both sexes are known as indicated above. The male sex possesses unusually asymmetrical genitalia.

(31) *Phyllophaga (Listrochelus) pilosipes* Saylor

Plate 17, fig. 5.

Listrochelus puberulus LECONTE, 1863, Smith. Mis. Coll., 6:78 (not *puberulus* Du Val, 1851); HORN, 1878, Trans. Amer. Ent. Soc., 7:142.

Phyllophaga (Listrochelus) pilosipes SAYLOR, new name, 1940, Proc. U. S. Nat'l. Mus., No. 3095, p. 76, f. 11 (l-n).

Type locality: Cape San Lucas.

Recorded distribution: Santa Rosa; also Michelbacher and Ross material from Triunfo in July, and San Bartola in July.

New records: Todos Santos, X-10-41, and Las Animas, Sierra Laguna, X-12-41, both collected by Ross and Bohart, in Lower California.

This species is closely related only to *peninsularis* Saylor, from which it differs especially in the tarsal claws. The Triunfo specimens are somewhat more sparsely pubescent on the abdomen than the others.

(32) *Phyllophaga (Listrochelus) peninsularis* Saylor

Plate 17, fig. 6.

Phyllophaga (Listrochelus) peninsularis SAYLOR, 1940, Proc. U. S. Nat'l. Mus., No. 3095, p. 77, fig. 3 (h, i).

Type locality: Purissima, October.

Known only by the type series of 3 specimens. The male genitalia are slightly asymmetrical. As mentioned under *pilosipes* Saylor above, these two species form a characteristic group in facies which is readily apparent in any miscellaneous collection of specimens.

(33) *Phyllophaga (Listrochelus) mucorea* (LeConte)

Listrochelus mucoreus LECONTE, 1856, Jour. Acad. Nat. Sci. Philadelphia, (2), 3:263; HORN, 1878, Trans. Amer. Ent. Soc., 7:144; BATES, 1888, Biol. Cent.-Amer. 2, 2:173.

Listrochelus texanus LECONTE, 1856, l. c., p. 263; HORN, 1878, l. c., p. 144.

Listrochelus obtusus LECONTE, 1856, l. c., p. 264; HORN, 1878, l. c., p. 144.

Phyllophaga (Listrochelus) mucorea, SAYLOR, 1940, Proc. U. S. Nat'l. Mus., No. 3095, p. 86, fig. 8 (d-f).

Type locality: Fort Yuma, Colorado River, California, in the LeConte collection. Also, Eagle Pass, Texas.

Recorded distribution: One of our commonest and most widespread species, being known from California, Arizona, New Mexico, Texas, and Kansas. One specimen in the Casey collection in the U. S. N. Museum from "Mexico" is a typical female. The lone Lower California record is that of Horn in 1878, from Cape San Lucas, and I believe that there is no doubt whatsoever now that his record referred to one of the recently described Saylor species from the Cape Region; I have included this species heréin, however, since the species should occur in the more northern parts of Lower California along the California and Arizona borders.

Since the species of the subgenus *Listrochelus* are so difficult to separate

with certainty on external characters alone, and since the genitalia of both sexes possess excellent distinguishing characters, the determiner should always dissect and study the sexual organs of his specimens. Very detailed keys to external characters are presented in the 1940 revision of the subgenus by the writer (Proc. U. S. National Museum, No. 3095, pp. 59 through 130), the keys being given on pages 62 through 72, the genitalia of both sexes and all pertinent anatomical features being figured in 13 plates and 155 figures. Because of the completeness of the above work, and its ready reference to all interested parties, the extensive keys are not reproduced here.

(34) ***Pelidnota lucae*** LeConte

Plate 19, fig. 7.

Pelidnota lucae LECONTE, 1863, New Spec. Col. I: 78.

Type locality: San Lucas, Lower California.

New records: Michelbacher and Ross obtained a large series of this species from various localities: San Bartola, Miraflores, Triunfo, and Santiago, all collected in July, at light. Also seen from "Cabo San Lucas."

The color is normally rufocastaneous, with a brilliant greenish lustre in most specimens, but some few individuals have no greenish tinge at all; in many individuals the head and thorax appear almost entirely greenish with a piceous undercolor. Varies from 13 to 22 mm. in length.

(35) ***Anomala peninsularis*** Schaeffer

Plate 19, fig. 5.

Anomala peninsularis SCHAEFFER, 1906, Jour. N. Y. Ent. Soc., 14:3; SCHAEFFER, 1907, l. c., p. 70.

Type locality: Santa Rosa.

New records: 118 specimens were obtained by Michelbacher and Ross from various locations on the peninsula: Triunfo on July 7 to 15, Miraflores on July 8 to 10, San Bartola on July 13 to 15, Santiago on July 8, and San Pedro on July 6.

This species is apparently limited to Lower California, and all specimens are testaceous, with rufous head and thorax, and all highly polished above; the thorax may vary to rufocastaneous or may even have castaneous cloudings. The size varies but little, from 9-12 mm.

(36) ***Anomala flavilla*** Bates

Anomala flavilla BATES, 1888, Biol. Centr.-Amer., 2(2):227.

Type locality: Tres Marias Islands, and Ventanas (in Durango, Mexico).

Recorded distribution: Mexico and Tres Marias Islands.

This species was not taken by Michelbacher and Ross, and the specific characters are discussed later herein in the species key.

(37) *Anomala flavilla centralis* LeConte

Plate 19, fig. 6.

Anomala centralis LECONTE, 1863, New Spec. Col. 1:78; HORN, 1884, Trans. Amer. Ent. Soc., 11:159; BATES, 1888, Biol. Centr.-Amer. 2(2):226; SCHAEFFER, 1906, Jour. N. Y. Ent. Soc., 14:2; SCHAEFFER, 1907, l. c., p. 69.

Type locality: Lower California.

Recorded distribution: California, Arizona, New Mexico, and northern Mexico.

Not taken by Michelbacher and Ross but a fairly common species in most large collections. Other than the color differences, I am unable to separate this from *flavilla* Bates and have therefore listed it as a subspecies of the latter.

(38) *Anomala raydoma* Saylor, new species

Male: Robust oval, slightly wider behind. Glabrous above. Color testaceous with piceous cloudings along elytral sutures, edges of elytra; midapex of thorax with one large piceous spot, this most frequently triangular in shape but very variable and often widening to one-half or more the thoracic width; rarely the elytra infused with considerably more piceous than usual; head usually rufous. *Head* with front and clypeus flat and very coarsely, somewhat variolately punctate, the surface rough and somewhat scabrose; suture of clypeus straight and hardly impressed; clypeus moderately long, sides subparallel, angles broadly rounded, apex subrounded, entire outline quadrate with well-rounded angles, all margins noticeably reflexed. *Antenna* testaceous, 9-segmented; club fairly long and nearly subequal in length to entire stem of antenna. *Thorax* with all margins strongly indicated and complete, with a few cilia laterally, all angles very obtuse, sides semirounded; disc very finely and moderately densely punctate. *Elytra* somewhat rugose, glabrous, moderately densely punctate. *Pygidium* very convex, scabrosely punctate, with a few erect hairs, especially apically. Fore tibia strongly bidentate, with no trace of a third tooth. Front inner claw small, twisted slightly back upon its base, and with a very faint hairlike tooth on the inner side; outer claw small, not twisted, and entire. Middle legs with outer claw distinctly cleft, inner a little smaller and entire. Both claws hind legs long and entire.

Female: Antennal club ovate, subequal in length to funicle. Inner claw both front and middle tarsi not twisted but strongly cleft. Hind claws long, simple, the inner a little shorter. Length 8–9.5 mm. Width 4–5.5 mm.

The male *Holotype* (C.A.S. No. 5693) is from **Santiago**, Lower California, July 8, collected by Michelbacher and Ross, and the female *Allotype* (C.A.S. No. 5694) is from San Domingo, collected by Michelbacher and Ross on July 19. Numerous paratypes of both sexes were collected by Michelbacher and Ross at the same localities as the types, and other from: 5 miles S. of Miraflores on July 10, 8 miles NE. of Cape San Lucas on July 10, 15 miles N. of El Refugio on July 4, Venancio on July 17, Chapala Dry Lake on June 21, 20 miles N. of

Comondu on July 23, Coyote Cove in Concepcion Bay on July 24, San Ignacio on June 24, and San Miguel on July 3.

The species is relatively common and should have been described ere now, but I am unable to find an established name for it; possibly it has been mixed with *flavilla* Bates in most collections, and indeed I have received specimens of this species and *flavilla* and *centralis*, all determined by Ohaus as *flavilla*, so that the species is often confused, even by experts. The key points out the essential differences between the above-mentioned species:

KEY TO LOWER CALIFORNIAN ANOMALA

1. Anterior tibia definitely *bidentate*; head with front and vertex very closely scabrose, the vertex entirely covered with transverse rugosities, the greater part of vertex with none or few definitely separate punctures visible; male antennal club long, nearly subequal to the entire stem; color testaceous with head rufous, the markings of thorax consisting of a single, usually triangularly shaped piceous spot, or irregularly piceous in the anterior $\frac{2}{3}$, never entirely testaceous and never with two distinctly separated piceous spots. L. Calif. **raydona**, new species

Anterior tibia definitely *tridentate*, very rarely the upper tooth subobsolete but even then barely visible as such; front coarsely rugose near clypeal suture but the largest part of vertex densely and coarsely punctate and the punctures definitely separated. Male club definitely smaller, usually subequal to funicle or a little longer; thoracic color testaceous, the disc entirely testaceous or with two distinctly separated piceous spots 2

2. Thoracic disc always with two distinct, large piceous spots, one on each side of middle, and often a much smaller piceous sublateral spot; elytral margins with narrow black border, this often widened and in some few individuals the elytra are entirely black except for an irregular testaceous line covering about the central third of each elytron; common in Calif., Ariz., and northern Mexico. **flavilla** Bates

Dorsal coloration entirely testaceous, the thorax always entirely unicolorous and the elytra usually with a very narrow black marginal border. California

flavilla var. **centralis** LeConte

(39) *Cyclocephala dimidiata* Burmeister

Plate 15, fig. 2.

Cyclocephala dimidiata BURMEISTER, 1847, Hand. der Ent., 5:57; SAYLOR, 1937, Pomona Jour. Ent. Zool., 39:70 (as *Dichromina*).

Cyclocephala dimidiata, SAYLOR, 1945, Jr. Wash. Acad. Sci., 35:382, f. 1 (h, l). (Revision of U. S. Species.)

Ochrosidia ocularis CASEY, 1915, Mem. Coleop., 6:162.

Cyclocephala elegans HORN, 1871, Trans. Amer. Ent. Soc., 3:337.

In the present species, as well as all *Cyclocephala* discussed herein, I have omitted all except the most important or pertinent references, since these have just been reviewed in detail by the writer in the recently published "Synoptic Revision of the U. S. Scarab Beetles of the Subfamily Dynastinae, No. I: Tribe Cyclocephalini," in the Jour. of the Wash. Academy of Sciences, December, 1945, Volume 35, number 12. As explained therein, the Dynastine bibliography is now so extensive and detailed in most genera that very little is to be gained by citing every unimportant reference, if a complete list is reasonably available.

Type locality. "Mexico."

Recorded distribution: This common species ranges from Arkansas and through the entire southwestern United States, to Mexico, Lower California, and through Central and South America.

This scarab beetle has been recorded as damaging green fruits and leaves of fruit trees, roses, and walnuts, and also the grass of lawns. Closely related to *longula* LeConte in the male genitalia (a little longer parameres there), this species differs mainly in the constant coloration as well as the ovate antennal club, the same being very well developed in *longula*.

(40) *Cyclocephala hirta* LeConte

Plate 15, fig. 1.

Cyclocephala hirta LECONTE, 1861, Proc. Acad. Nat. Sci. Philadelphia, p. 346; CASEY, 1915, Mem. Coleop. 6:132 (as *Spilosota*).

Cyclocephala hirta, SAYLOR, 1945, Jour. Wash. Acad. Sci., 35:384.

See the Saylor reference above for a complete bibliography for this species, which has appeared under the names of *magister* Casey, *palidissima* Casey, *inconspicua* Casey, *nubeculina* Casey, and *lurida* Bland.

The mentum is very strongly acuminate and pointed, with the maxilla emerging from the sides of the "point." The maxilla have only three minute, hardly discernible teeth. The species is usually testaceous, with castaneous and irregular cloudings on the thorax and elytra; most of the Arizona and Texas forms are entirely testaceous.

Recorded distribution: A widely distributed species, ranging from California, Utah, Nevada, Arizona, and Texas, into Lower California (the more northern parts).

(41) *Cyclocephala longula* LeConte

Plate 15, fig. 3.

Cyclocephala longula LECONTE, 1863, New Species of Coleoptera, I:79; CASEY, 1915, Mem. Coleop., 6:158 (as *Ochrosidia*).

Cyclocephala longula, SAYLOR, 1945, Jour. Wash. Acad. Sci., 35:384, f. 1 (g, m, o).

The extensive bibliography of this species is given in the Saylor paper above, and the 11 Casey synonyms and others are listed.

Type locality: Cape San Lucas.

Recorded distribution: Very widely distributed in Oregon, Arizona, Utah, all parts of California and into Lower California. Michelbacher and Ross secured extensive series throughout the peninsula.

The species is commonly attracted to lights in the summer months; the color varies very little, and the elongate form and sharply reflexed clypeus will readily place the species. Very close to *dimidiata* Burmeister in male genital characters but especially different in the much longer antennal club of both sexes, and the forked front claw in the male of *dimidiata* being here at most finely cleft, or entire.

(42) *Cyclocephala pasadenae* (Casey)

Plate 15, fig. 4.

Ochrosidia pasadenae CASEY, 1915, Mem. Coleop., 6:148; SAYLOR, 1937, Pomona Jour. Ent. and Zool., 39:70 (as *Cyclocephala*).

Cyclocephala pasadenae, SAYLOR, 1945, Jour. Wash. Acad. Sci., 35:385, f. 1 (e).

The species is completely reviewed in the Saylor paper cited above and the numerous Casey synonyms listed.

Recorded distribution: A common species throughout southern California, Arizona, New Mexico, Texas, and into Lower California (V. Trinidad, Saylor Collection).

New records: Michelbacher and Ross secured series at Comondu July 22, at Santo Tomas August 3, and at San Miguel on July 3.

This common species apparently does not vary very much in any of its external features. I feel certain that all previous records of *immaculata* (Oliver) occurring in Lower California refer to this species.

Since complete taxonomic keys are given to both sexes of the *Cyclocephala* occurring in Lower California, in the Saylor paper cited above, they are not repeated here, and the reader is referred to that revisional study for further details of the species.

(43) *Ligyris laevicollis* Bates

Plate 19, fig. 1.

Ligyris laevicollis BATES, 1888, Biol. Centr.-Amer. 2(2):316; CASEY 1915, Mem. Coleop., 6:190 (as *Gryllus*); CARTWRIGHT 1944, Ann. Ent. Soc. Amer., 37:35; SAYLOR, 1946, Jour. Wash. Acad. Sci., 36:44, f. 1.

Ligyris bryanti RIVERS, Proc. Calif. Acad. Sci. ser. 2, 3:97; SAYLOR, 1946, l. c., p. 44.

The species is adequately discussed in the writer's revision of the U. S. species in the genus in the paper cited above, entitled "Synoptic Revision of the U. S. Scarab Beetles of the subfamily Dynastinae, No. 3: Tribe Oryctini (part)." It varies in color from rufous and highly-polished specimens of 18 mm. in length, to large piceous or black, semidull specimens as large as 28 mm.; however, the male genitalia of all the variables are identical. The smoothness of the impunctate first elytral interval is very characteristic of the species.

Type locality: "Baja California."

Recorded distribution: Baja California and the west coast of Mexico as far south as Acapulco; also recorded by Bates as far south as British Honduras, though this may be an erroneous specific determination, and very probably is. I have also seen one female specimen 29 mm. long from Phoenix, Arizona.

(44) *Ligyris gibbosus* (DeGeer)

Plate 19, fig. 2.

Scarabaeus gibbosus DEGEER, 1774, Memoires pour servir a l'histoire des insectes, 4:322; CASEY, 1915, Mem. Coleop., 6:204 (as *Ligyris*).

Ligyris gibbosus, SAYLOR, 1946, Jour. Wash. Acad. Sci., 36:42.

This species has an unusually extensive bibliography, having been catalogued under at least five genera and Casey having described no less than 23 synonyms of it, and other authors had added several more. The reader is referred to the Saylor paper cited above for complete history and details on the species.

Recorded distribution: Nearly the entire United States, and the northern parts of Lower California. Occurs also in Mexico. I have examined nearly 1300 examples in my studies of this species.

Commonly known as the carrot-muck beetle, this species breeds in all types of soil rich in organic matter, and both larvae and adults are known to feed underground on many plants, some of them of economic importance, such as *Guayule*, sugarbeets, potatoes, carrots, and other root crops.

(45) *Oxygrylius ruginasus* (LeConte)

Plate 19, fig. 3.

Ligyris ruginasus LECONTE, 1856, Proc. Acad. Nat. Sci. Philadelphia, 8:20; CASEY, 1915, Mem. Coleop., 6:209 (as *Oxygrylius*).

Oxygrylius peninsularis CASEY, 1915, l. c., p. 209; SAYLOR, 1946, Jour. Wash. Acad. Sci., 36:44, f. 1.

Recorded distribution: A very common species in all parts of Lower California and northern Mexico and Sonoran regions (Sinaloa, etc.). Rarer in the United States, being known from Arizona, New Mexico, and California.

I have examined nearly 400 examples of this species and all possess both the midapical thoracic tubercle and the small to moderate fovea behind the tubercle, the differences between individuals being mostly in size and slightly in color.

(46) *Megasoma thersites* LeConte

Megasoma thersites LECONTE, 1861, Proc. Acad. Phila., p. 336.

Megasomina thersites, CASEY, 1915, Mem. Coleop. 6:263.

Recorded distribution: Lower California.

New records: Arizona: Coyote Mts., 3500 ft., August (Saylor Collection); Lower California: collected by Michelbacher and Ross at San Venancio on October 8.

Easily separated in the male from all U. S. dynastids by the combination of the strongly bifurcate clypeal horn, combined with the sharp tooth of each front thoracic angle, and the moderate to short, narrow, erect, weakly bifurcate horn of the mid-disc of thorax. The female is readily separable from the female *Strategus* by the widely separated front teeth on the apex of the clypeus (one at each side angle), as well as the sharp, bidentate mandibles and the nonmargined center base of the thorax. Male genitalia apparently inseparable from those of *Dynastes tityus* (Linnaeus).

(47) *Phileurus illatus* LeConte

Plate 19, fig. 4.

Phileurus illatus LECONTE, 1854, Proc. Acad. N. S. Philadelphia, 7:80; CASEY, 1915, Mem. Coleop. 6:267; RITCHER, 1944, Bull. 467 of Ky. Agric. Exp. Sta., p. 43 (Larvae).

Phileurus vitulus LECONTE, 1866, l. c., p. 80; CAZIER, 1939, Bull. S. Calif. Acad. Sci., 38:170.

Phileurus phoenicis CASEY, 1915, l. c., p. 267; CAZIER, 1939, l. c., p. 170.

Phileurus puncticollis CASEY, 1915, l. c., p. 268; CAZIER, 1939, l. c., p. 170.

Goniophileurus femoratus (Burmeister), KOLBE, 1910, Ann. Ent. Soc. Belg., LIV:149 and 344 (pars); ARROW, 1937, Trans. Ent. Soc. London, 86:86 and 90; CAZIER, 1939, l. c., p. 170; BLACKWELDER, 1944, Bull. U. S. Nat'l. Mus. # 185, pars 2, p. 257.

Recorded distribution: Arizona, southern California, northern Mexico, Lower California.

New records: Taken by Michelbacher and Ross at Triunfo, on July 7.

Several incorrect citations and much controversy concerning this species have appeared since Kolbe in 1910 described the genus *Goniophileurus* for *femoratus* Burmeister, and placed *illatus* LeConte and *vitulus* LeConte as synonyms of it. As explained in more detail in part IV of the author's "Synoptic Revision of the U. S. Scarab Beetles of the Subfamily Dynastinae" (now in manuscript in the Washington Academy of Sciences), the mandibles of our species are quite simple, and not toothed as Kolbe claims, and our species apparently have nothing to do with the French Guianan *femoratus*, and the literature should be so corrected.

Recorded from the trunks of trees in the larval state in Arizona (*Dasyllirion*). I have also seen a specimen, apparently of this species, from the Rancho La Brea tar pits in southern California, probably representing a (?) Pleistocene Period specimen.

The two LeConte synonyms of *illatus* and *vitulus*, as well as the two Casey synonyms of *phoenicis* and *puncticollis*, are listed and discussed in the Cazier paper listed above and the reader is referred to that paper for further details.

Recorded distribution: California, Arizona, New Mexico, and south into Lower California, Venezuela, Ecuador, and Cayenne (the type locality).

New records: Michelbacher and Ross obtained the species at Triunfo on July 7.

The synonymy of this species has been greatly muddled, and the genus *Goniophileurus* erected by Kolbe for this species is invalid because the latter author described the mandibles as two or three dentate, whereas they are quite simple; therefore, it is uncertain as to what species the name *Goniophileurus* applies. At any rate, I believe that *femoratus* is not generically different from our other species such as *castaneus* Haldemann or *truncatus* Palisot de Beauvois.

PLATES

PLATE 13

a. Male antennal club

b. Lateral view of male genitalia

Fig. 1. *Acoma robusta* Van Dyke

Fig. 2. *Acoma dilemma* Saylor, new species

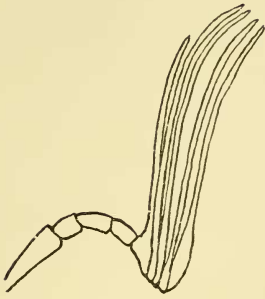
Fig. 3. *Acoma confusa* Van Dyke (variety from Triunfo)

Fig. 4. *Acoma cazieri* Saylor, new species

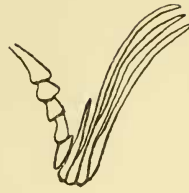
Fig. 5. *Acoma rossi* Saylor, new species

Fig. 6. *Acoma sexfoliata* Saylor, new species

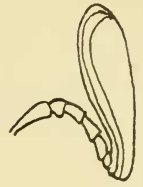
Fig. 7. *Acoma confusa* Van Dyke (variety from La Paz)



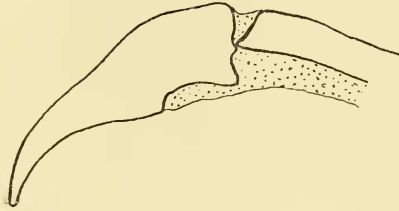
1 A



2 A



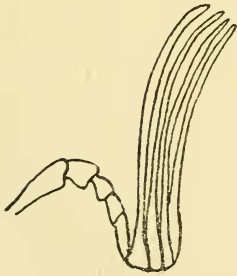
3 A



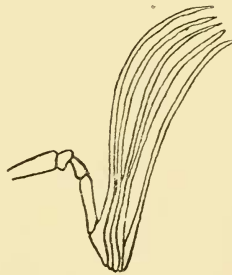
1 B



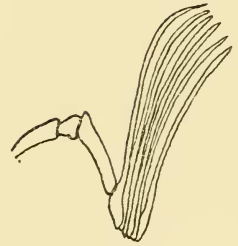
7 A



4 A



5 A



6 A

PLATE 14

a. Lateral view of male genitalia b. Idem,—other view c. En-face view of male genitalia

Fig. 1. *Serica ensenada* Saylor, new species

Fig. 2. *Serica rossi* Saylor, new species

Fig. 3. *Serica sculptilis* Dawson

Fig. 4. *Serica michelbacheri* Saylor, new species

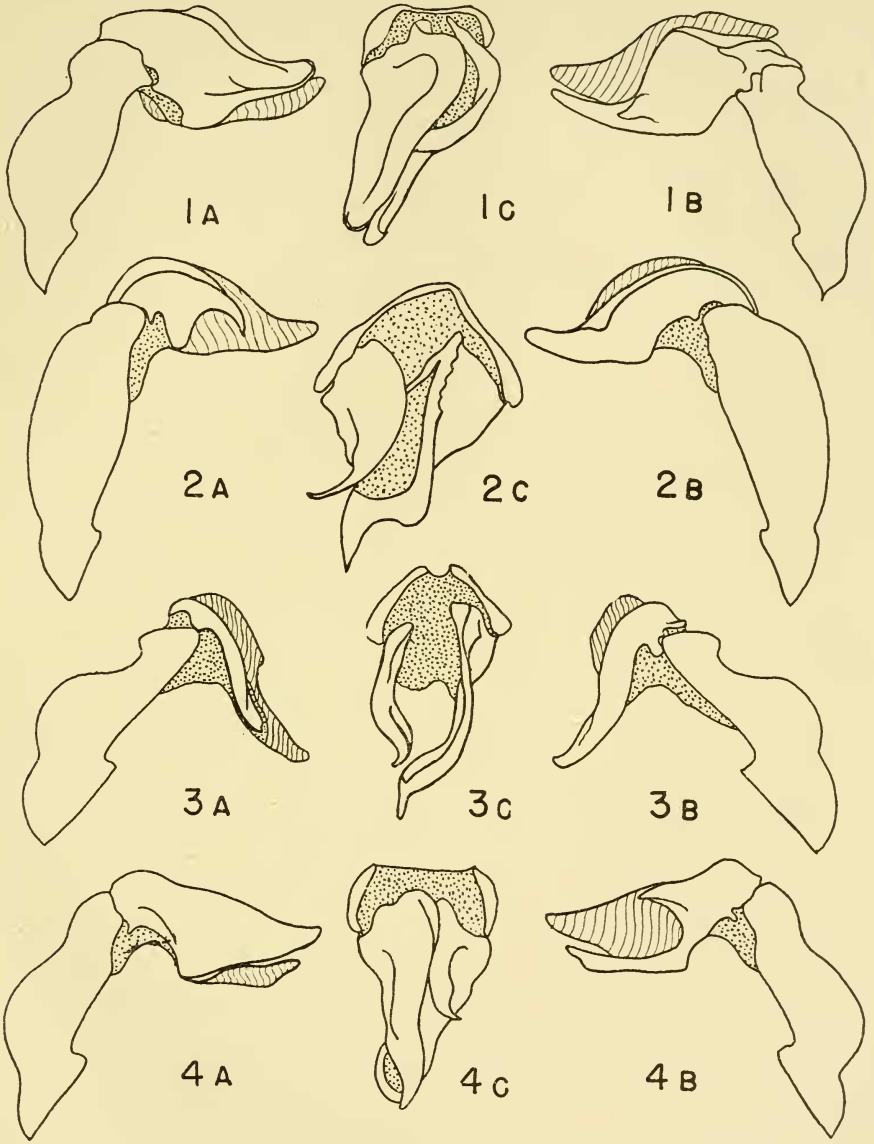


PLATE 15

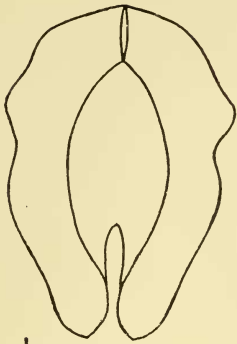
- a. Front male claws, inner view b. Front female claws, inner view
c. En-face view of male genitalia

Fig. 1. *Cyclocephala hirta* LeConte

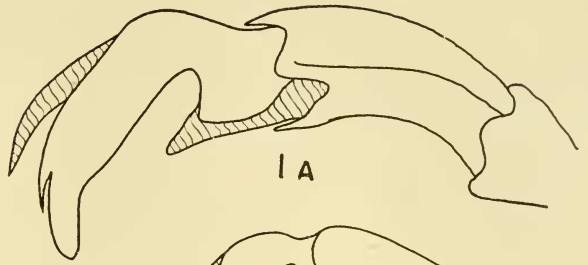
Fig. 2. *Cyclocephala dimidiata* (Burmeister)

Fig. 3. *Cyclocephala longula* LeConte

Fig. 4. *Cyclocephala pasadenae* (Casey)



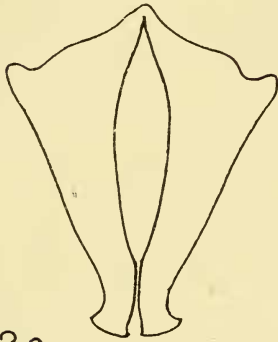
1c



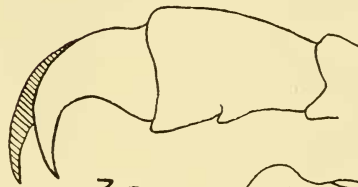
1A



3A



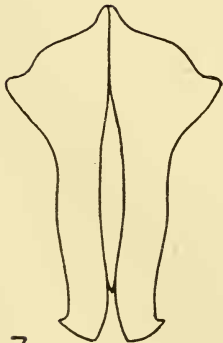
2c



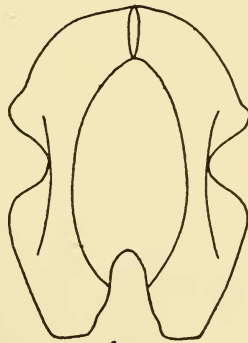
3B



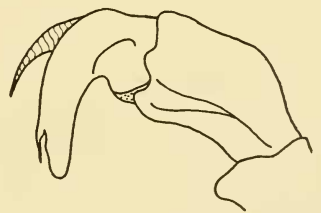
2A



3c



4c



4A

PLATE 16

a. Lateral view of male genitalia b. Idem,—other side c. En-face view of male genitalia

Fig. 1. *Serica serensia* Saylor, new species

Fig. 2. *Serica craighead* Saylor

Fig. 3. *Serica praetermissa* Dawson

Fig. 4. *Serica alternata alternata* LeConte

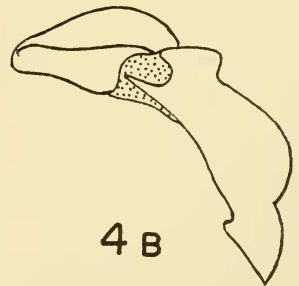
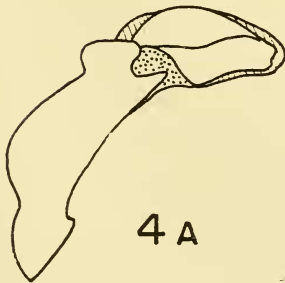
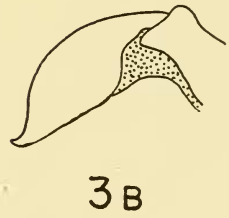
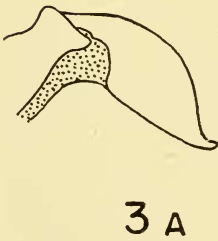
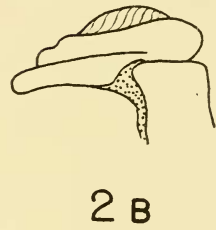
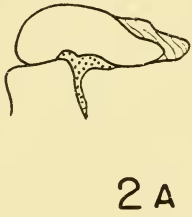
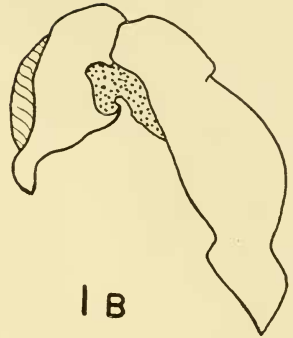
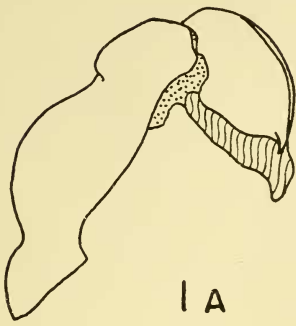


PLATE 17

a. Lateral view of male genitalia b. Idem,—other side c. En-face view of male genitalia
d. Lateral view of female genitalia e. Female genitalia

Fig. 1. *Phyllophaga michelbacheri* Saylor

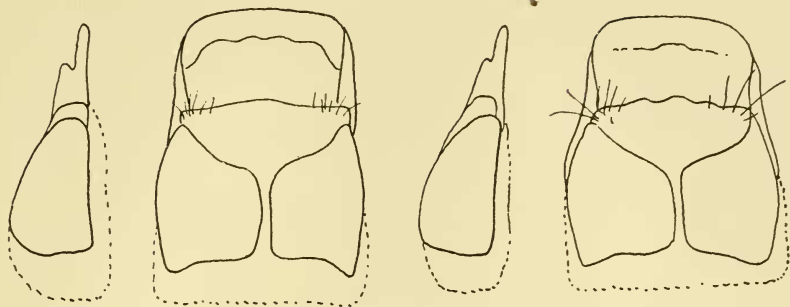
Fig. 2. *Phyllophaga densicollis* (LeConte)

Fig. 3. *Phyllophaga miraflores* Saylor

Fig. 4. *Phyllophaga carminator* (Horn)

Fig. 5. *Phyllophaga pilosipes* Saylor

Fig. 6. *Phyllophaga peninsularis* Saylor

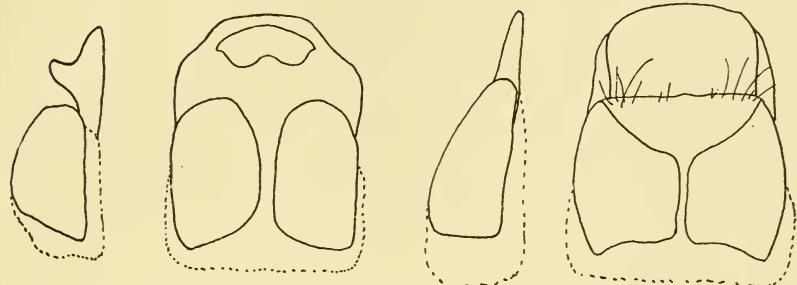


1D

1E

2D

2E

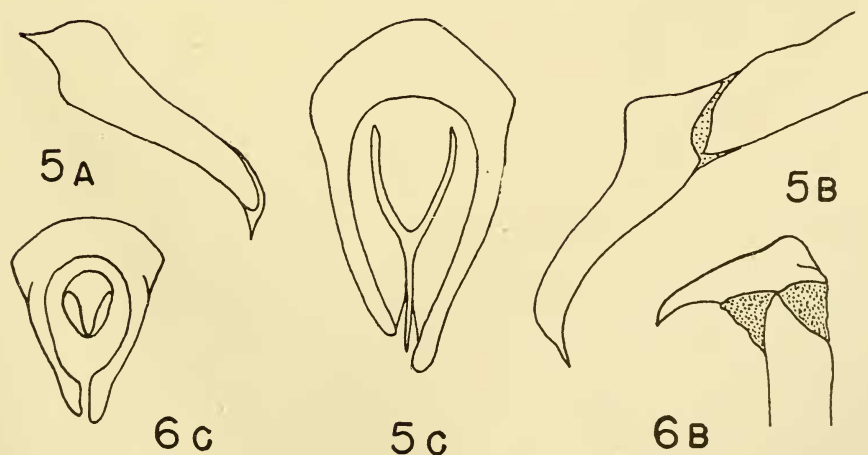


3D

3E

4D

4E



5A

5B

6A

5C

6B

PLATE 18

- a. Lateral view of male genitalia b. En-face view of male genitalia
c. and d. Variations of typical form, lateral and en-face views

Fig. 1. *Phyllophaga densicollis* (LeConte)

Fig. 2. *Phyllophaga miraflores* Saylor

Fig. 3. *Phyllophaga carminator* (Horn)

Fig. 4. *Phyllophaga michelbacheri* Saylor

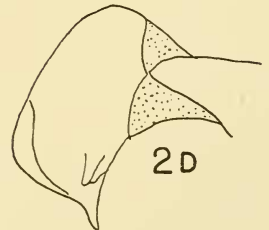
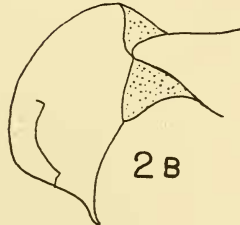
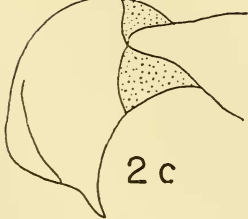
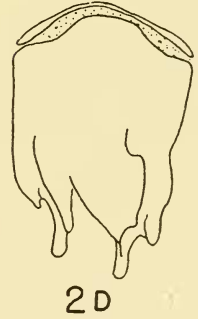
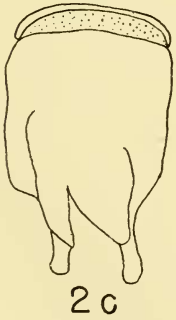
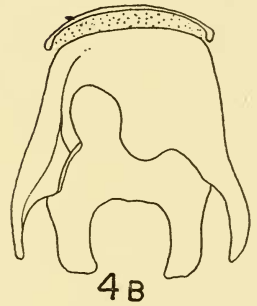
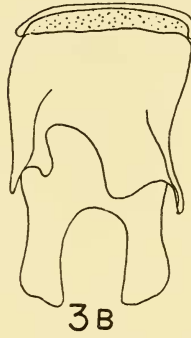
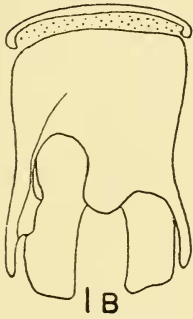
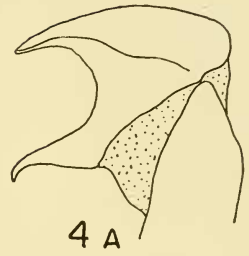
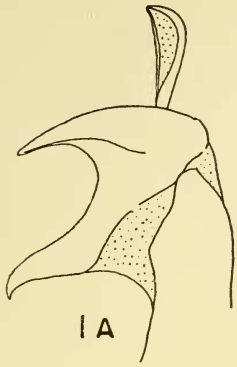


PLATE 19

- a. En-face view male genitalia b. Ventral view male genitalia c. Front claw, female
d. Front claw, male e. Lateral view male genitalia

Fig. 1. *Ligyryus laevicollis* Bates

Fig. 2. *Ligyryus gibbosus* (DeGeer)

Fig. 3. *Oxygryllus ruginasus* (LeConte)

Fig. 4. *Phileurus illatus* LeConte

Fig. 5. *Anomala peninsularis* Schaeffer

Fig. 6. *Anomala centralis* LeConte

Fig. 7. *Pelidnota lucae* LeConte

